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NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Dicroglossidae, *Quasipaa fasciculispina* (Inger, 1970): Distribution extension

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ABSTRACT: The current work presents a new locality for *Quasipaa fasciculispina* (Inger, 1970) documenting the first provincial record based on voucher specimens for Trat Province (eastern Thailand). Its geographical distribution is reviewed and a recent distribution map in Thailand is presented.

As a result of Ohler and Dubois (2006), a new working taxonomy of the tribe Paini was proposed. The genus *Quasipaa* Dubois, 1992 currently contains 10 described species [*Q. acathophora* Dubois and Ohler, 2009, *Q. boulengeri* (Günther, 1889), *Q. courtoisi* (Angel, 1922), *Q. exilispinosa* (Liu and Hu, 1975), *Q. fasciculispina* (Inger, 1970), *Q. jiulongensis* (Huang and Liu, 1985), *Q. shini* (Ahl, 1930), *Q. spinosa* (David, 1975), *Q. verrucospinosa* (Bourret, 1937), and *Q. yei* (Chen, Qu and Jiang, 2002)] which are distributed across southern and southwestern China to central Vietnam, eastern Thailand and southwestern Cambodia (Frost 2010). *Q. fasciculispina was* originally described as *Rana fasciculispina* based on an adult male (holotype, National Center for Reference Collections of Thailand, number 513-1385) and a female (paratype, Field Museum of Natural History 171309); both collected from "*Khao Soi Dao, Changwat Chantaburi, Thailand*" (currently Khao Soi Dao Wildlife Sanctuary, Chanthaburi Province, Thailand) by Inger (1970). This species has been recently found to be endemic to the Thai-Cambodian border according to various published works (*e.g.*, Inger 1970; Ohler *et al*. 2002; Chan-ard 2003; Nabhitabhata *et al*. 2004; Inthara *et al*. 2005, 2009; Nabhitabhata and Chan-ard 2005; Stuart and Emmett 2006; Grismer *et al*. 2008; Thy *et al*. 2010). Its global status (see van Dijk and Swan 2004) is identified as Vulnerable (VU) because its extent of occurrence is less than 20,000 square km. The distribution is severely fragmented and the population is continuing to decline because of decline in the extent and quality of its forest habitat in Cambodia and Thailand. Given the local status in Thailand, Nabhitabhata and Chan-ard (2005) list its status as VU. This species, both frogs and tadpoles, is illegally collected for food (Inthara *et al*. 2009).

Supaprom and Baimai (2004) report that the mitotic karyotype consist of 8 metacentric (M) and 5 submetacentric (SM) pairs. The group of large chromosomes comprises 2 M (nos. 1 and 5) and 3 SM (nos. 2, 3 and 4) while the group of small chromosomes includes 6 M (nos. 6, 7, 8, 10, 11 and 12) and 2 SM (nos. 9 and 13). A secondary constriction is clearly observed in the middle of the short arm of chromosomes no. 6 (6 p.). Its tadpole was figured by Inthara et al. (2005) and subsequently larval external and buccal morphologies were described by Inthara *et al*. (2009).

In the current study, a series of 11 juvenile specimens (THNHM 18238-18248, unsexed, SVL 25.83-75.93 mm) were collected from Huay Khao Plu (12°23'29" N, 102°40'51" E at an elevation of 120 msl), near the Trat Agroforestry Research Station (TARS; coordinate 12°23'35" N, 102°40'6" E at an elevation of 40 msl), Muang Trat District, Trat Province on 19 March 2010. These specimens were catalogued and deposited in the collection of the Thailand Natural History Museum, Pathum Thani (Thailand). These frogs (Figure 1) were assigned to *Q. fasciculispina* as its morphological characters conformed to Inger's (1970) description. *Quasipaa fasciculispina* is characterized by the following characters: 1) back with numerous short, thick ridges, none as long as diameter of eye, interspersed with circular warts and 2) webbing complete. During the survey, no adult frogs were observed.

In Khlong Kreua Wai Wildlife Sanctuary (Chanthaburi Province), photographs of live *Quasipaa fasciculispina* were taken from the sanctuary by a forest ranger on 23 January 2009 (Figure 1 right) and 3 February 2009 (Figure 1 upper left). After photography, the frogs were released at the capture sites. The adult male possessed the secondary sex characters conforming to Inger (1970) such as: forearm enlarged, throat with circular whitish tubercles bearing strong black spines in each tubercle.

Prior to this study, the distribution of *Quasipaa fasciculispina* in Thailand was reported from the provinces of Chanthaburi [Khao Chamao-Khao Wong National Park (Forest Biology Department unpublished data), Khao Kitchakut National Park (Noikotr and Lauhachinda 2002; Chan-ard 2003; Nabhitabhata *et al*. 2004; Inthara *et al*. 2005; Nabhitabhata and Chan-ard 2005), Khao Sip

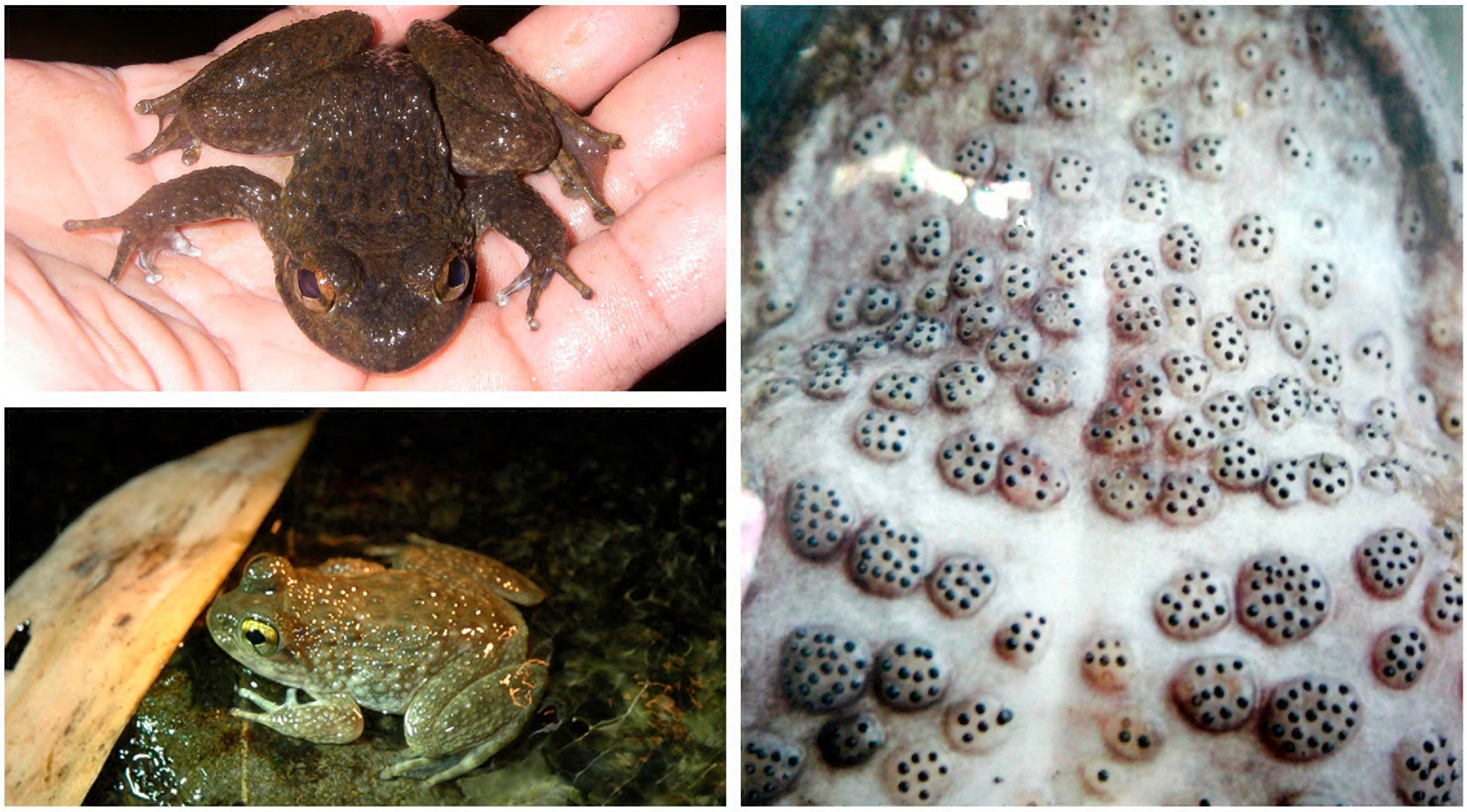

FIGURE 1. Life photographs of *Quasipaa fasciculispina*. Upper left (Khlong Kreua Wai Wildlife Sanctuary, Chanthaburi Province); bottom left (Huay Khao Plu, Muang Trat District, Trat Province); and right (cluster of spines on chest and breast of adult male in breeding season).

Ha Chan National Park (Danaisawat *et al*. 2010), Khao Soi Dao Wildlife Sanctuary (Inger 1970; Chan-ard 2003; Nabhitabhata *et al*. 2004; Nabhitabhata and Chan-ard 2005; Inthara *et al*. 2009), and Namtok Phliew Naitonal Park (Chan-ard 2003, as Khao Sra Baab)] and Trat [Bo Rai District (Inthara *et al*. 2005)]. The locality lying southward from the type locality (Khao Soi Dao) is "Khao Sra Baab" according to Chan-ard (2003), but neither voucher specimens nor photographs are provided in this work. Although Chan-ard (2003) provides a live photo of this species, the photograph did not provide the locality of the frog. A herpetological study in Namtok Phliew National Park was recently conducted by Narongrit Sukprakarn, but the research failed to document *Q. fasciculispina* in the national park (see Sukprakarn and Nabhitabhata 2003). Moreover, the distribution in Thailand is usually claimed to range from eastern Thailand extending to the Cardamom Mountains in western Cambodia (see Chan-ard 2003). However, the record indicates that the occurrence of this species in Trat Province was in Inthara *et al*. (2005). Unfortunately, they did not refer to voucher specimens. Although several studies were conducted in Trat Province (*e.g.*, Smith and Kloss 1915; Taylor and Elbel 1958; Taylor 1962; Ha-Ngam *et al*. 2006) unfortunately, they failed to document *Q. fasciculispina*. Therefore, the current work documents the first provincial record (based on voucher specimens) for the province, and its geographical distribution of the species in Thailand is now extended southward to Trat Province. The collected site is *ca*. 150 km southeastern from the type locality (Figure 2). The area is a secondary forest which was been previously logged.

Although knowledge about the evolution, systematics and taxonomy of painid frogs has substantially increased (see Jiang *et al*. 2005; Frost *et al*. 2006; Ohler and Dubois 2006; Inthara *et al*. 2009), there are still gaps or

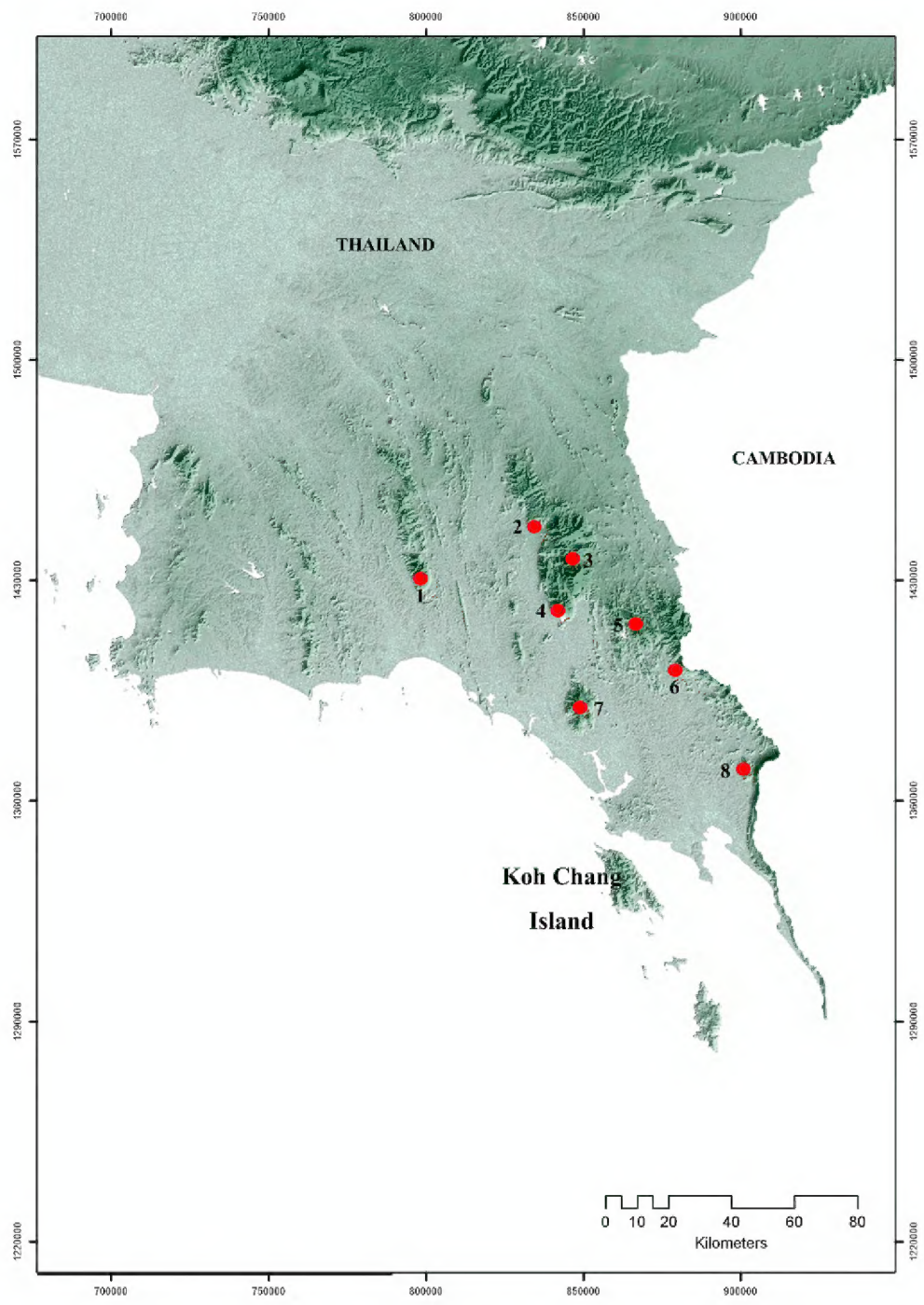

FIGURE 2. Distribution of *Quasipaa fasciculispina* in Thailand. 1, Khao Chamao-Khao Wong National Park (Chanthaburi Province); 2, Khao Sip Ha Chan National Park (Chanthaburi Province); 3, Khao Soi Dao Wildlife Sanctuary (Chanthaburi Province); 4, Khao Kitchakut National Park (Chanthaburi Province); 5, Khlong Kreua Wai Wildlife Sanctuary (Chanthaburi Province); 6, Bo Rai District (Trat Province); 7, Namtok Phliew National Park (Chanthaburi Province); and 8, Muang District (Trat Province).

insufficiencies in other basic knowledge. These gaps might be due to the members of this group inhabiting a specific microhabitat in swift streams (Bourret 1937; Liu 1950), usually in montane areas. The members of *Quasipaa* are considered as rare species. The 10 species of *Quasipaa* are listed in four categories of the IUCN Red List of Threatened species (IUCN 2010): Endangered (one species, *Q. boulengeri*), Vulnerable (five species, *Q. exilispinosa*, *Q. fasciculispina*, *Q. jiulongensis*, *Q. shini* and *Q. spinosa*), Near Threatened (one species, *Q. verrucospinosa*), Data Deficient (one species, *Q. yei*). Two species (*Q. acathophora* and *Q. courtoisi*) are not in the list. Thus, voucher specimens are quite rare in natural history collections and might inadequately support the study of this group in various disciplines.

The global and local status of *Quasipaa fasciculispina* have the same VU evaluation according to two published works (Nabhitabhata and Chan-ard 2005; Stuart *et al.* 2008) and IUCN (2010). The species is protected under the WARPA law of Thailand. The species is found in protected areas (such as national parks and wildlife sanctuaries etc.) where there is strong enforcement to its conservation. However, illegal consumption still occurs and more intensive conservation strategies are needed. Further study is needed to explore the distribution range in neighboring areas. Probably additional undiscovered populations exist in the streams of a small range of mountains along the Thai-Cambodian border and also in the mountain on an island such as Koh Chang (southwestern of locality 5 in Figure 2). Other disciplines are recommended to further research: exploitation pressure, status evaluation, and frog propagation.

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